United States Patent [19]

Gemmill

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[54] **DRAFT GEAR REMOVING DEVICE**

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[73] Assignee: **Burlington Northern Inc.,** St. Paul, Minn.

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[52] **U.S. Cl.** ..... **29/427;** 29/252; 254/93 HP

[51] **Int. Cl.²** **B23P 19/02**

[58] **Field of Search** ..... 29/427, 426, 244, 252, 29/253, 283; 254/93 HP, 93 R

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Assistant Examiner—James R. Duzan
Attorney, Agent, or Firm—Merchant, Gould, Smith, Edell, Welter & Schmidt

[57] **ABSTRACT**

A hydraulic extractor and its use in removing damaged draft gear which are wedged in railway cars. It consists of a length of pressure resistant hose folded at its center to lie flat upon itself when empty, and having connections at both ends for receiving hydraulic fluid under pressure. Also included is an arrangement for feeding the hose into the restricted space above the draft yoke and below the draft sill. That arrangement comprises a pair of strips of sheet metal of a width generally the same as that of the flat hose, and means connecting the strips together at one end. The hose is placed between the strips, with the fold near the connecting means. A rudimentary winch is provided for connection by a cable to the metal strips where they are connected. In use, the cable is fed through the space to be expanded, and connected to the winch, and the hose in its protective metal strips is winched into the desired location. When hydraulic fluid under pressure is forced into the hose at both ends, it expands laterally, driving the draft yoke and draft gear downward and out of the pocket.

9 Claims, 7 Drawing Figures

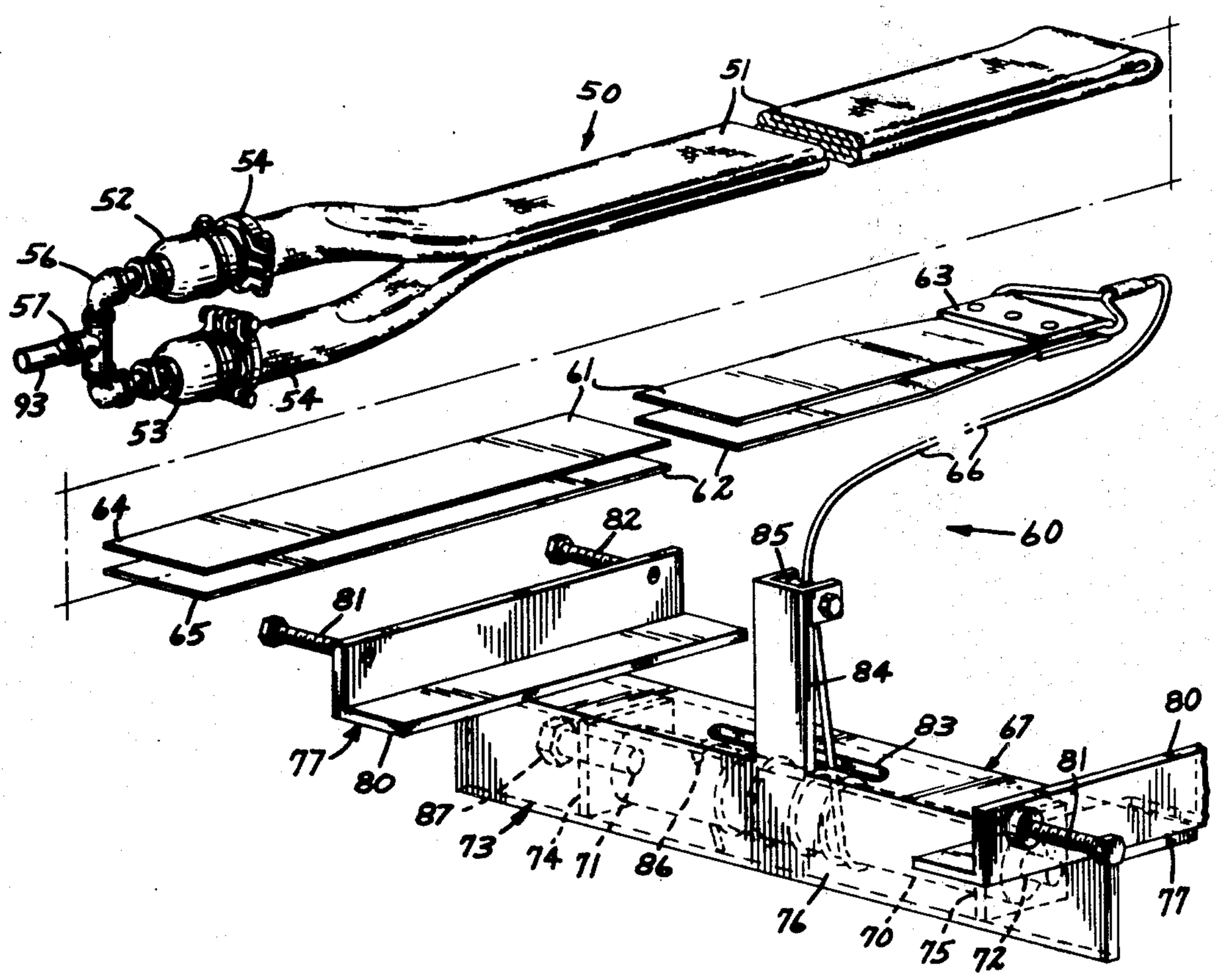

FIG. 1

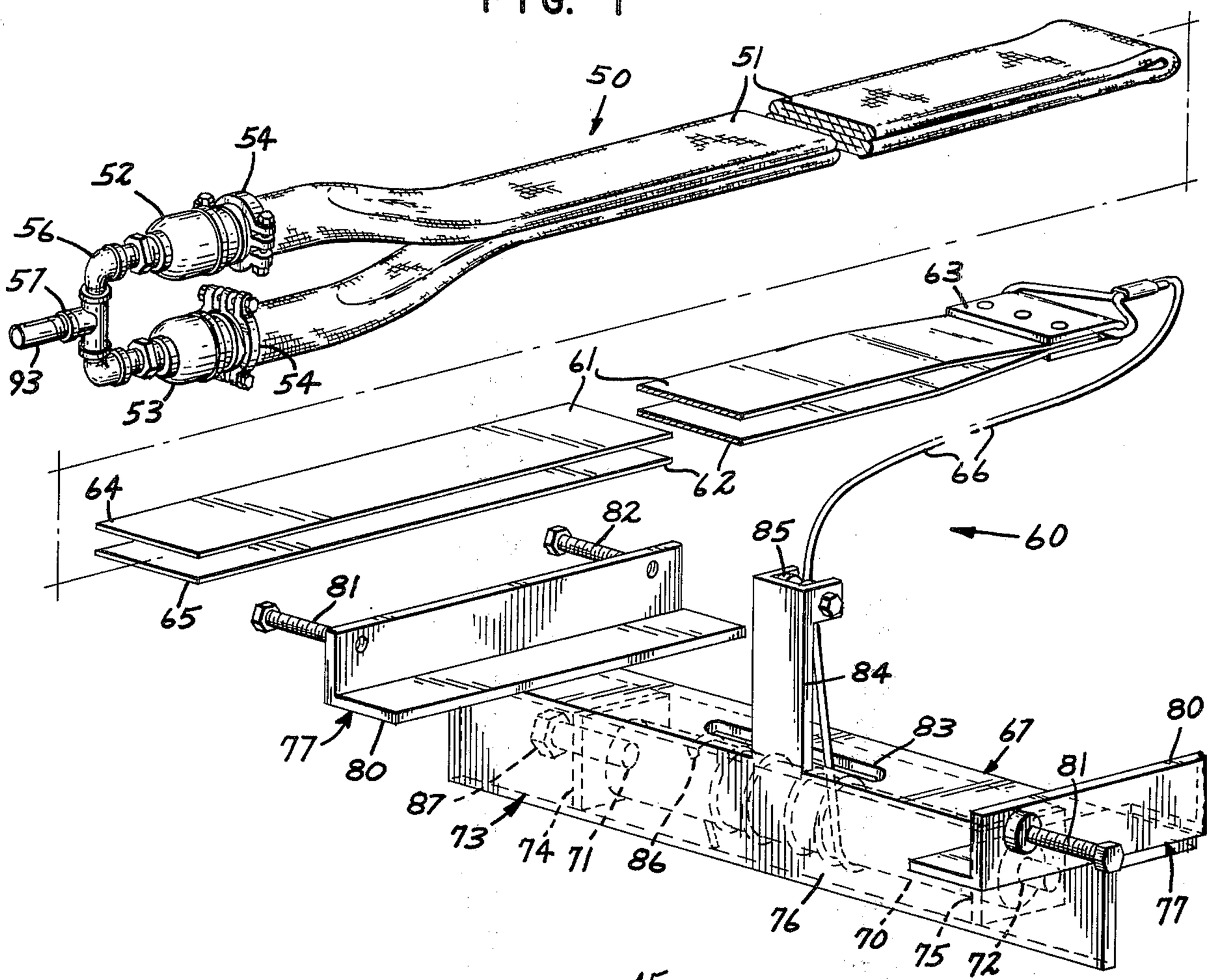
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FIG. 2

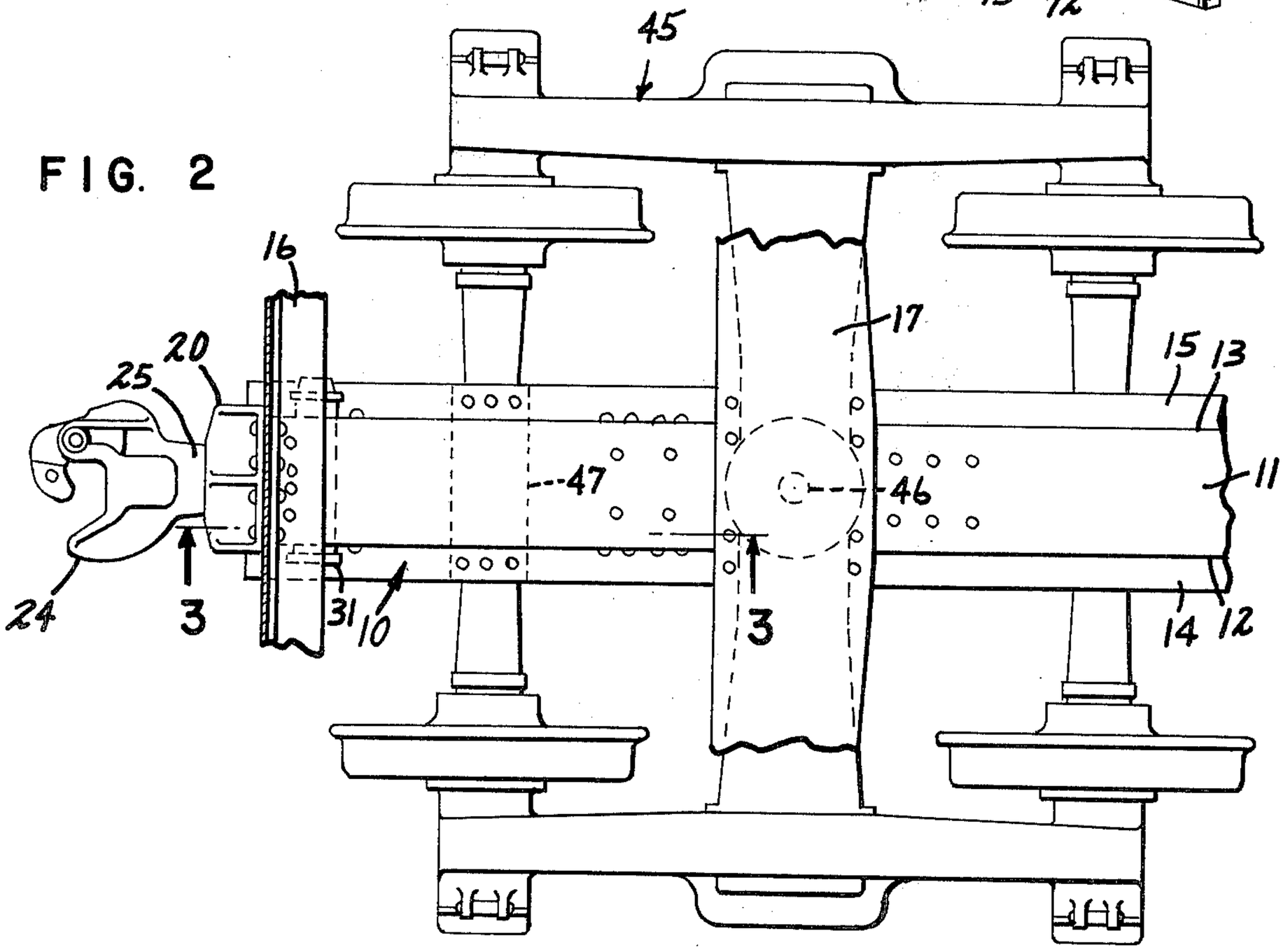
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FIG. 3

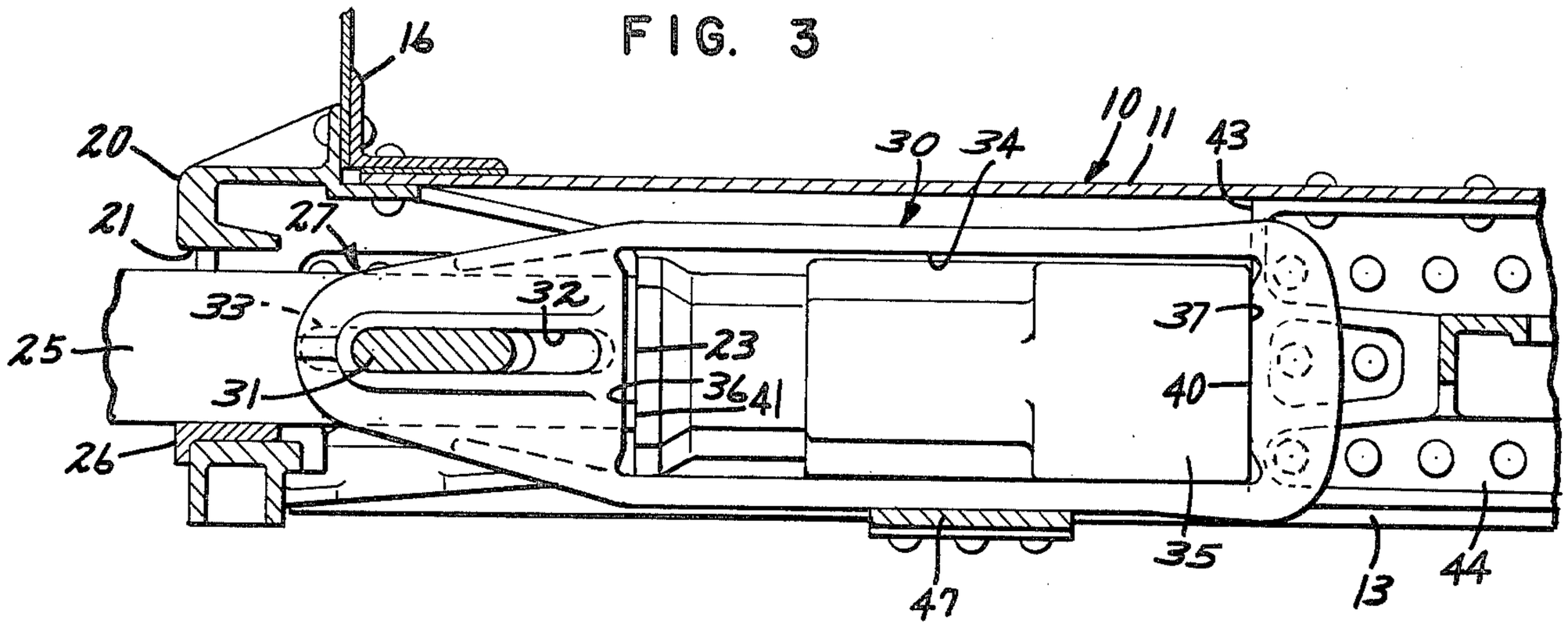


FIG. 6

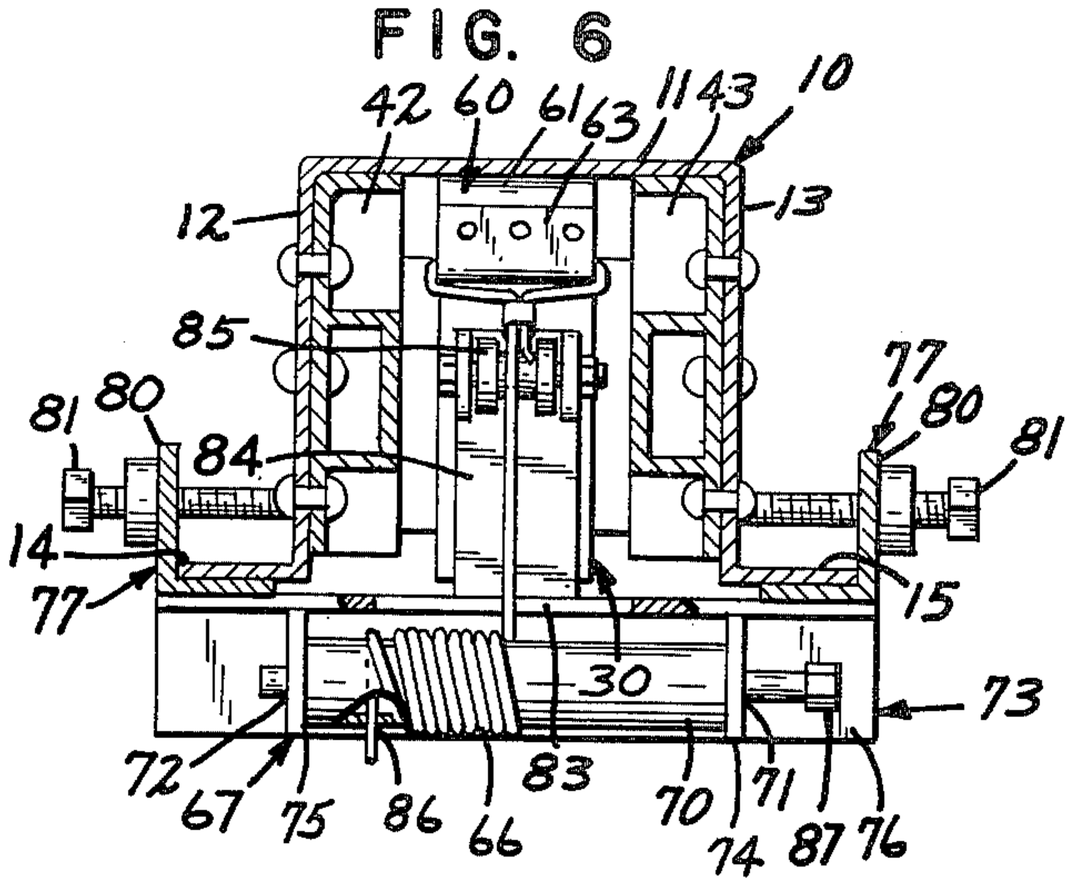
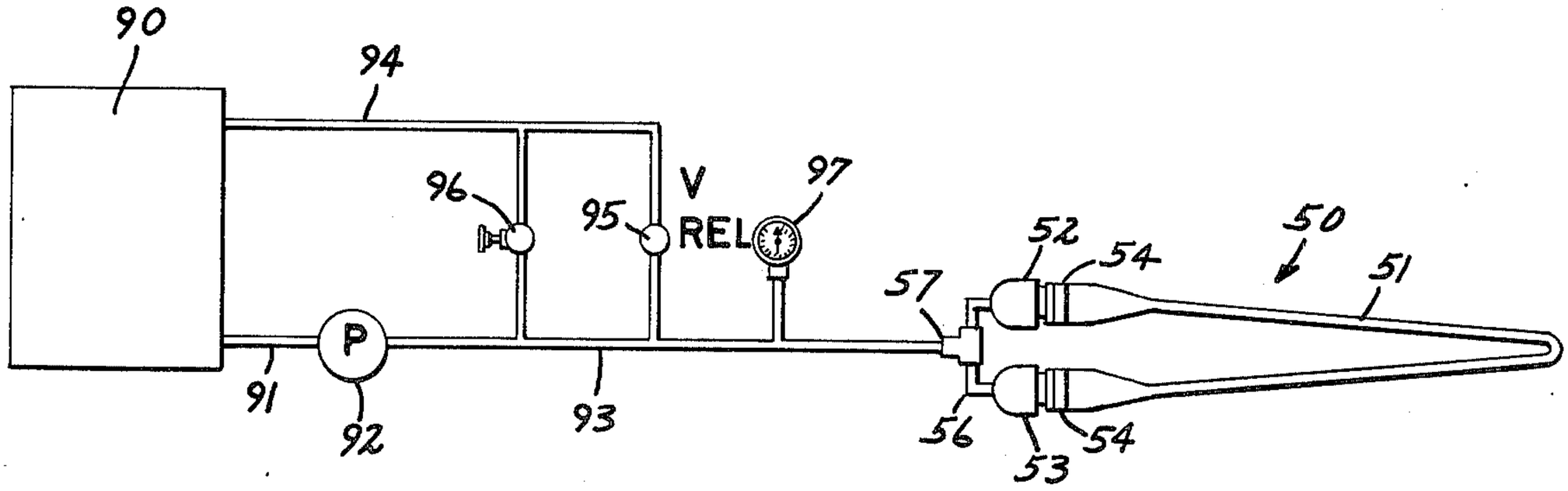


FIG. 7



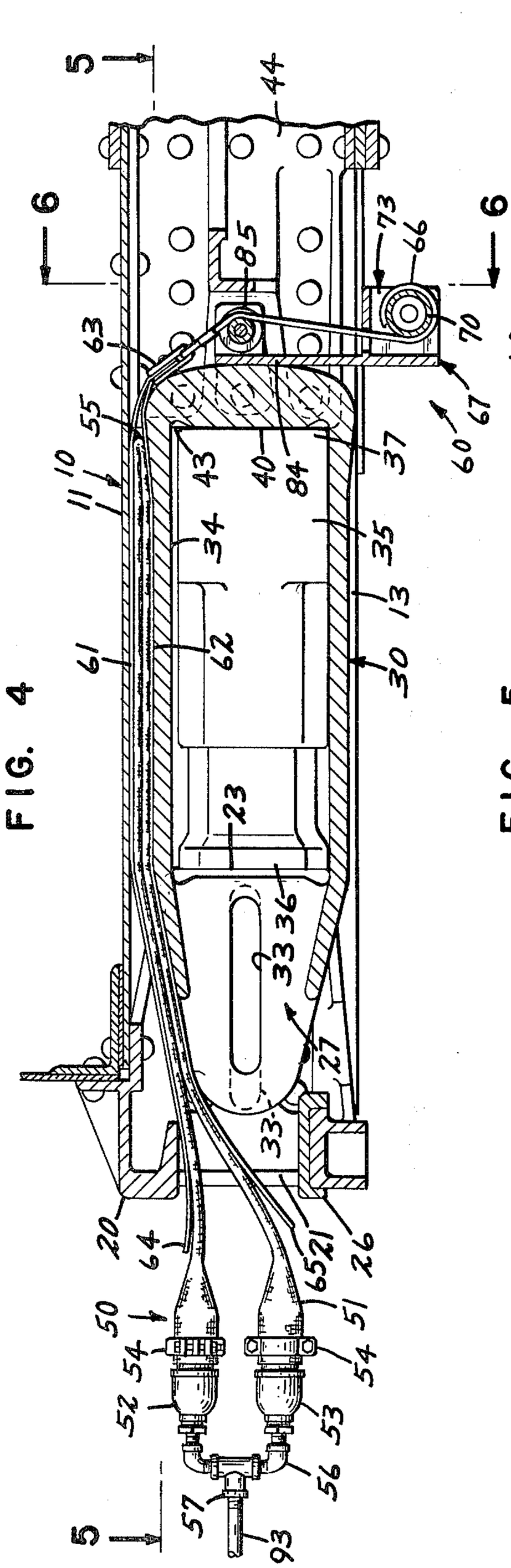

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FIG. 4

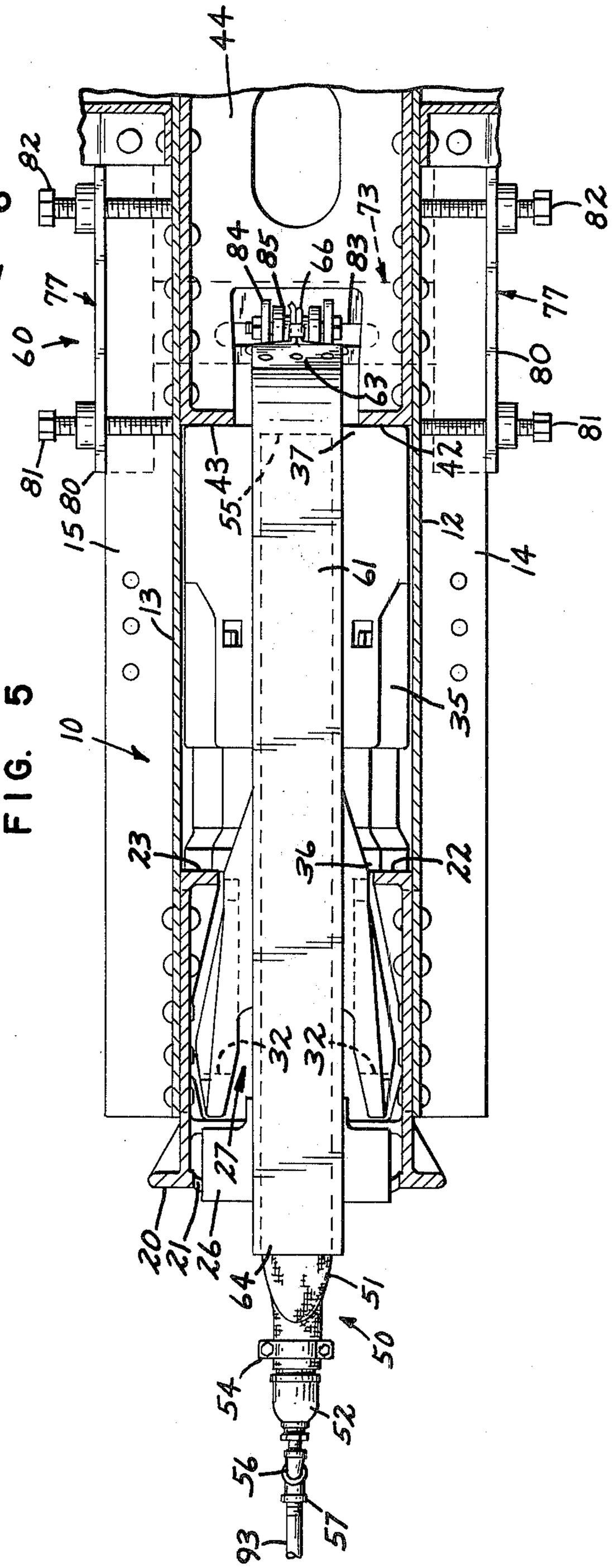
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FIG. 5

DRAFT GEAR REMOVING DEVICE

BACKGROUND OF THE INVENTION

This invention relates to the field of railroad engineering, and more particularly to an implement for use in railroad car repair shops. One of the regular tasks encountered in car repair is the replacement of damaged draft gear, and very often the damage results in the draft gear becoming wedged tightly in place. Undamaged draft gear are arranged to drop freely by gravity when appropriate retaining members are removed, but the nature of car construction is such that there is no space for the insertion of pries, jacks or other devices of mechanical advantage to assist in the removing the gear when it does not come out freely. Elaborate and time consuming torch cutting procedures are frequently resorted to which not only damage other parts of the car not related to the problem, but also must later be repaired at the cost of further expense and time.

My invention comprises a draft gear extracting arrangement which can be used in any car repair shop to extract wedged or otherwise irremovable draft gear without the need to cut away any portions of the car, and which is simple and inexpensive in construction and easy and safe to use. It includes a hydraulically expandable member or hose and insertion means including a rudimentary winch for introducing the hose while flat into the restricted space always available above a damaged draft gear, together with a source of hydraulic fluid under pressure. When hydraulic fluid is pumped into the hose, the latter expands, forcing the damaged gear out of its resting place.

Various advantages and features of novelty which characterize my invention are pointed out with particularity in the claims annexed hereto and forming part hereof. However, for a better understanding of the invention, its advantages and objects attained by its use, reference should be had to the drawing which forms a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing, FIG. **1** is a perspective view showing the elements making up my invention by themselves;

FIG. **2** is a plan view of one end of a railroad car underpinning showing the general field in which my invention is used;

FIG. **3** is a fragmentary sectional view generally along the line **3—3** of FIG. **2** to further clarify the situs in which my invention is used;

FIG. **4** is a view generally like FIG. **3** but showing my invention being introduced;

FIG. **5** is a fragmentary horizontal sectional view along the line **5—5** of FIG. **4;**

FIG. **6** is a fragmentary transverse sectional view along the line **6—6** of FIG. **5;** and

FIG. **7** is a schematic showing of my invention connected with a suitable source of hydraulic fluid under pressure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The construction of a railroad car in the neighborhood of the draft gear is shown in FIGS. **2** and **3.** A draft sill **10** extends below the center of the car for its full length, and is of inverted U-shape in section, having a top **11,** a pair of sides **12** and **13,** and a pair of flanges **14** and **15.** Cross members such as members **16** and **17** are riveted to the top of the draft sill for supporting the car body. A steel strike casting **20** is inserted in the end of draft sill **20,** and is configured to have an opening **21** and a pair of inwardly directed vertical draft lugs **22** and **23.** The coupler includes a shank **25** which projects through the strike casting, resting on a sill plate **26,** and into an opening **27** formed at one end of a draft yoke **30.**

A cross key **31** fits loosely in a horizontal slot in coupler shank **25** and passes through aligned but longer horizontal slots **32** and **33** in the draft yoke **30** and in sill walls **12** and **13,** respectively. Yoke **30** has a large aperture **34** to contain the draft gear **35,** which for the present purposes may be considered to be simply a shock absorber carried in yoke **30** and projecting beyond it on either side. When the car is being accelerated, one end **36** of draft gear **35** engages draft lugs **22** and **23,** and the other end **37** engages yoke **30** at **40.** When the car is being backed, end **36** of draft gear **35** engages the end of coupler shank **25** at **41,** and end **37** engages a further pair of draft lugs **42** and **43** comprising portions of a complex steel casting **44,** riveted into sill **10,** to which the truct **45** of the car is pivoted at **46.** It is not uncommon to use somewhat shorter draft gear and interpose spacer plates between it and the inner surfaces of opening **34.**

Normal draft gear replacement or repair calls for removal of cross key **31** and coupler **25:** then when a carrier iron **47** is removed, the draft yoke **30** with the draft gear **35** within it may be lowered out of the sill "pocket" for servicing or replacement. The merciless pounding given to draft gear not only in coupling and uncoupling cars but also in over-the-road operation, frequently results in the draft gear being split or otherwise enlarged so that portions of it engage the draft sill, preventing the yoke and draft gear from moving downward when carrier iron **47** is removed. My invention is designed to apply force between the top of yoke **30** and the top **11** of draft sill **10** above it, to force the yoke out of the sill.

Turning now to FIG. **1,** my invention comprises a pliable tubular member **50** and insertion means **60.** Member **50** may conveniently comprise a length of high pressure hose **51** having connections **52** and **53** at its ends to which it is secured by suitable hose clamps **54.** To obtain maximum spacial displacement, the hose **51** is folded on itself at **55.** A suitable Y-connection **56** of conventional plumbing fittings is arranged for connection at an inlet **57** to a source of hydraulic fluid under pressure.

Insertion means **60** comprises a pair of strips **61** and **62** of abrasion resistant material such as sheet metal which is fairly rigid without being wholly inflexible. Strips **61** and **62** are joined together at first ends by a connecting means **63:** the other ends **64** and **65** of the strips are free. Connecting means **63** is arranged to be connected with a filar member or cable **66** by which traction may be applied to the device to move it generally in the direction of its own longitudinal axis.

Also a part of insertion means **60** is a rudimentary winch **67** comprising a drum **70** pivotally mounted at **71, 72** in a frame **73** of any suitable construction which, for example, comprise a pair of pivot bearing plates **74** and **75** welded into an angle iron **76,** to which is also welded a clamping arrangement **77** including angle

irons **80** and a pair of attaching bolts **81** and **82.** One leg of angle iron **76** is slotted as at **83,** and an arm **84** is arranged to project outwardly at the location of slot **83** to carry a pulley **85.** Drum **70** is cross bored at **86:** when the free end of cable **66** is fed downward through slot **83** and passed through cross bore **86,** rotation of the drum causes the cable to be wound therearound. Drum **70** is extended to include, or is provided with, a hexagonal drive member **87** by which rotation of the drum may be manually accomplished using a ratchet wrench or other suitable instrument.

FIG. **7** shows the simple hydraulic system needed for use of my invention. A reservoir **90** of hydraulic fluid is connected by a conduit **91** to the input of an electric or manual pump **92,** the output of which is connected by a conduit **93** to connection **57** of my tubular member **50.** A return conduit **94** is also provided, and is connected to conduit **93** by a pressure relief valve **95** and by a normally closed manual valve **96** which may be opened to release pressure in conduit **93:** for convenience a pressure gauge **97** may be included in the system. I have found it convenient to mount elements **90-97** on a cart or skid, not shown, so that they may be brought to the vicinity of any car being worked on. If pump **92** is mnaually operable, the entire system is self-contained and can be used wherever the cart can be taken.

FIGS. **4-6** show my invention in use. Cable **66** is unwound from drum **70** and pulled loose. The free end of the cable is fed through the opening **21** in strike casting **20,** over the top of yoke **30,** and down behind the yoke. Hose **51** is inserted, folded, between strips **64** and **65** of insertion means **60,** the fold being next to connecting means **63.** Winch **67** is temporarily secured under the flanges **14, 15** of sill **10** with arm **84** projecting upwardly to bear against the rear curve of the yoke, cable **66** is passed over pulley **85** and through slot **83** and cross bore **86.** Now, but rotating drum **70,** the cable can be wound on it, drawing the insertion device into the space above yoke **30** and between the yoke and the top portion **11** of the draft sill. The process is continued until the condition shown in FIGS. **4** and **5** is reached: it is not necessary thereafter to maintain tension on cable **66.** Conduit **93** is coupled to inlet **57.** Now, when hydraulic fluid under pressure is supplied at inlet **57,** each layer of hose **50** expands toward a circular cross section. This applies tremendous force between the draft sill portion **11** and the top of yoke **30,** and the latter is forced downward, carrying the damaged draft gear **35** with it. The amount of expansion of the doubled hose is usually sufficient to perform the extraction in one operation: if more displacement is needed, the insertion device is depressurized, a timber or other spacer of the proper thickness is placed on top of yoke **30,** and the process is repeated until the draft gear is forced from the draft sill, and may be removed with the yoke containing it.

From the above, it will be apparent that I have invented a new and useful implement for extracting damaged draft gear from railroad cars. The implement is easily and cheaply constructed, from equipment generally available in car repair shops, and is quickly and conveniently used to perform a task heretofore performed only by laborious and indirect procedures which, moreover, damaged portions of the cars.

Numerous characteristics and advantages of my invention have been set forth in the foregoing description, together with details of the structure and function

of the invention, and the novel features thereof are pointed out in the appended claims. The disclosure, however, is illustrative only, and changes may be made in detail, especially in matters of shape, size and arrangement of parts, within the principle of the invention, to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A method of extracting damaged draft gear from a railroad car from which the coupler, cross key, and carrier iron have been removed which comprises the steps of:

a. positioning an empty pliable tubular member between insertion means comprising a pair of overlying strips of abrasion resistant material connected together at first ends, said overlying strips engaging the tubular member only frictionally;

b. pulling on the connection between said strips to draw the insertion means and hence the tubular member endwise into and substantially through the restricted space between the draft yoke and the draft sill thereabove; and

c. supplying fluid under pressure to said tubular member to cause it to expand laterally, applying force from said strips to displace the yoke and gear downwardly.

2. The method of claim **1** in which the tubular member is folded on itself, and positioned in the insertion means so that the fold enters the restricted space first.

3. The method of claim **1** which includes the preliminary steps of:

a. feeding one end of a filar member, in a direction toward the center of the car, through the space into which the insertion means is to be introduced, the other end of said filar member being attached to the insertion means at the connected ends thereof, and

b. using the filar member to winch the insertion means into the restricted space.

4. Apparatus for removing damaged draft gear from a railroad car comprising, in combination:

a pliable tubular member of pressure resistant material;

insertion means for drawing the member while flat into the restricted space above the yoke of the draft gear to be removed, said means comprising two overlying substantially flat strips of abrasion resistant material, the width of said strips beging generally that of the tubular member when flat, and connecting means for joining together first ends of the two strips, the other ends being free, so that when the tubular member is inserted between the strips, the inner faces of the strips frictionally engage outer surfaces of the tubular member; and

means for conducting fluid under pressure to the member so that its resulting expansion may force the yoke and draft gear downwardly.

5. Apparatus according to claim **4,** together with traction means including:

a filar member attached to the connecting means of the insertion means;

a winch comprising a drum, means for connecting the filar member to the drum for coiling therearound, a frame, and means for mounting the drum for rotation in the frame;

means for securing the frame to the bottom of a draft sill at the location of a draft gear to be extracted;

an arm projecting upwardly from the frame to bear laterally against the end of the draft yoke when the frame is so secured;

and a pulley carried by the arm to lead the filar member from the insertion means to the drum of the winch.

6. Apparatus according to claim **4** in which the tubular member is folded on itself and is inserted into the restricted space fold first, and in which the fluid is conducted to both ends of the tubular member.

7. Apparatus according to claim **4** in which the tubular member is folded on itself and is positioned in the insertion means with the fold adjacent the connecting means thereof, and in which the fluid is conducted to both ends of the tubular member.

8. Apparatus according to claim **4** together with a source of hydraulic fluid and means supplying fluid from said source under pressure to the tubular member.

9. Apparatus according to claim **4** in which abrasion resistant material is sheet metal.

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